EY – Python Programming

Operators

1. **Write a Python program to calculate the area of a triangle where the lengths of the three sides are 5, 6, and 7.**

```
a = 5
b = 6
c = 7
s = (a + b + c) / 2
area = (s*(s-a)*(s-b)*(s-c)) ** 0.5
print(f"The area of the triangle is {area}")
```

2. Write a Python program to convert temperature from Celsius to Fahrenheit and vice versa. Use the formula `C/5 = (F-32)/9`.

```
def celsius_to_fahrenheit(c):
    return (c * 9/5) + 32

def fahrenheit_to_celsius(f):
    return (f - 32) * 5/9

c = 0
f = celsius_to_fahrenheit(c)
print(f"{c}°C is {f}°F")

f = 32
c = fahrenheit_to_celsius(f)
print(f"{f}°F is {c}°C")
```

Conditional Statements

1. Write a Python program that checks if a number is positive, negative, or zero.

```
num = float(input("Enter a number: "))
if num > 0:
    print("Positive number")
elif num == 0:
    print("Zero")
else:
    print("Negative number")
```

2. Write a Python program that finds the largest number among three given numbers.

```
a, b, c = 10, 14, 12

if a > b and a > c:
    print(f"{a} is the largest number")
elif b > a and b > c:
    print(f"{b} is the largest number")
else:
    print(f"{c} is the largest number")
```

3. Loops

1. Write a Python program to print all prime numbers between 10 and 50.

```
for num in range(10, 51):
   if num > 1:
       for i in range(2, num):
           if (num % i) == 0:
               break
       else:
           print(num)
```

2. Write a Python program to calculate the factorial of a given number.

```
n = 5
factorial = 1

for i in range(1, n + 1):
    factorial *= i

print(f"The factorial of {n} is {factorial}")
```

4. break and continue

1. Write a Python program to print numbers from 1 to 10 except for multiples of 3.

```
for num in range(1, 11):
    if num % 3 == 0:
        continue
    print(num)
```

2. Write a Python program to find and print the first 5 prime numbers in a given range.

```
range_end = 20
count = 0

for num in range(2, range_end + 1):
    prime = True
    for i in range(2, num):
        if num % i == 0:
            prime = False
            break
```

```
if prime:
    print(num)
    count += 1
if count == 5:
    break
```

5. Data Structure

Immutable (Numbers, Strings, Tuple)

1. Write a Python program to reverse a tuple.

```
tuple1 = (1, 2, 3, 4, 5)
reversed_tuple = tuple1[::-1]
print(reversed_tuple)
```

2. Write a Python program to check if a given string is a palindrome.

```
s = "radar"
if s == s[::-1]:
    print("Palindrome")
else:
    print("Not a palindrome")
```

3. Write a Python program to find the sum of all elements in a list.

```
a = [1, 2, 3, 4, 5]
print(f"Sum of the list is: {sum(a)}")
```

Mutable (List, Dictionary, and Set)

1.Write a Python program to remove duplicates from a list.

```
a = [1,2,2,3,4,4,5]
a = list(set(a))
print(a)
```

2.Write a Python program to merge two dictionaries.

```
dict1 = {'a': 100, 'b': 200}
dict2 = {'x': 300, 'y': 200}
dict3 = {**dict1, **dict2}
print(dict3)
```

3.Write a Python program to find the intersection of two sets.

```
set1 = {1, 2, 3, 4, 5}
set2 = {4, 5, 6, 7, 8}
set3 = set1 & set2
print(set3)
```

4. Write a Python program to sum all the items in a dictionary.

```
my_dict = {'data1':100,'data2':-54,'data3':247}
print(f"Sum of all items: {sum(my_dict.values())}")
```

6. List Comprehension

1.Write a Python program to square the elements of a list.

```
a = [1, 2, 3, 4, 5]
squared_a = [x**2 for x in a]
```

```
print(squared_a)
```

2. Write a Python program to find all even numbers in a list using list comprehension.

```
a = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
even_numbers = [x for x in a if x % 2 == 0]
print(even_numbers)
```

7. Dictionary Comprehension

1. Write a Python program to create a dictionary where the keys are numbers between 1 and 5 (both included) and the values are squares of the keys.

```
d = {x: x**2 for x in range(1, 6)}
print(d)
```

2. Write a Python program to create a dictionary from a list, where the list elements are the keys and their indices are the values.

```
lst = ['a', 'b', 'c', 'd']
dct = {key: value for value, key in enumerate(lst)}
print(dct)
```

8. Function Definition

1. Write a Python function to check whether a number is perfect (a perfect number is a number that is the sum of its own positive divisors, excluding itself).

```
def is_perfect(n):
    sum = 0
    for i in range(1, n):
        if n % i == 0:
            sum += i
    return sum == n

print(is_perfect(6))  # Should return True
```

9. Scope of Variable (Local and Global)

1. Write a Python program that has a global variable `x` with a value of 10 and a function that attempts to modify `x` to 20. Print `x` before and after calling the function.

```
x = 10

def change_x():
    global x
    x = 20

print("Before:", x)
change_x()
print("After:", x)
```

2. Write a Python program that has a local variable named `x` inside a function and shows the difference in outputs when trying to print `x` both inside and outside the function.

```
def myFunc():
    x = 20
    print("Local x:", x)

x = 10
myFunc()
print("Global x:", x)
```

10. File Operation (r, w, a, r+, w+)

1. Write a Python program to create a file named `testfile.txt`, write 'hello world' in it, and then read and print its contents.

# Writing to the file

```
with open('testfile.txt', 'w') as file:
    file.write('hello world')
```

# Reading from the file

```
with open('testfile.txt', 'r') as file:
    content = file.read()
    print(content)
```

2. Write a Python program to append text to an existing file and then read the entire file.

```
# Assuming 'testfile.txt' already exists.
with open('testfile.txt', 'a') as file:
    file.write('\nAppending line.')

with open('testfile.txt', 'r') as file:
    content = file.read()
    print(content)
```